

REMARKS

This application is amended in a manner believed to place it in condition for allowance at the time of the next Official Action.

Claims 3 and 5 remain pending in present application.

Claim 3 is amended. Support for the amendment may be found generally throughout the specification, for example, at page 3, lines 24-25.

The Official Action rejects claims 3 and 5 under 35 USC §112, second paragraph, as being indefinite. The rejection is respectfully traversed.

The position of the Official Action is that while "consisting of chromium" is clear, "consisting of chromium oxide" is not.

Claim 3 recites a film consisting of oxidized chromium, which is consistent with the "oxidized chromium coat" generally used throughout the disclosure.

Therefore, claim 3 is definite, and withdrawal of the rejection is respectfully requested.

Claims 3 and 5 are rejected under 35 USC §103(a) as being unpatentable over KUZE et al. U.S. 4,119,761 (KUZE) in view of HUTKIN U.S. 4,088,544 (HUTKIN). This rejection is respectfully traversed.

KUZE is offered for teaching plating pure chromium onto a metallic substrate and forming a chromium oxide layer on the

substrate, wherein the oxidized layer has a surface roughness of 0.05 to 30 microns. The Official Action asserts that the oxidized layer is with or without an emissivity-improving agent, and when the agent is present, the agent is not at the outermost portion of the oxidized layer. The Official Action recognizes that KUZE does not disclose a surface roughness for the substrate, but solely for the oxide layer.

However, with respect to claim 3, KUZE fails to teach that for which it is offered for at least three reasons:

I. The outer layer of KUZE is different from the claimed invention.

KUZE discloses forming a heat radiation layer in which its blackening level is increased. Accordingly, the process during which the heat radiation layer is produced is not important, as KUZE discloses many processes. KUZE does not disclose forming a passivation film as claimed, or an anti-corrosion metal material, that has a resistance to highly corrosive gases or gases accelerating decomposition.

II. KUZE discloses an oxidized layer of chromium plus an emissivity-improving agent and/or an alloy.

KUZE clearly sets out one requirement for the heat radiating layer: that it is to be satisfactorily blackened. In the process where KUZE applies pure chromium plating as a coating material for a substrate, KUZE advises that an emissivity-improving agent be added to the substrate to diffuse into the

chromium coating material so that the heat radiation layer is satisfactorily blackened during the heating/oxidizing step. However, in the case of chromium alloy plating, KUZE discloses that the agent is optional, as the alloys are able to blacken during the heating step. See, e.g., column 4, lines 12-27 and column 6, lines 3-25. Thus, contrary to the statement made in the Official Action, in the pure chromium plating embodiment, KUZE does not disclose "with or without" an agent.

Indeed, one of ordinary skill in the art would have been strongly discouraged from forming a heat radiation layer consisting of oxidized chromium, as one would not have been able to obtain the desired heat radiation properties of KUZE, which require that the oxidized layer is satisfactorily blackened.

III. KUZE discloses that the emissivity-improving agent is present in the outermost layer.

KUZE discloses the agent diffuses into the plating layer, "resulting in that the oxide layer fomred [sic] in the subsequent heating step is enabled to be blackened to a satisfactory extent." See, e.g., column 4, lines 18-23. Thus, the agent is present at the outermost portion to enable the heat radiation layer to be visibly blackened in the heating/oxidizing step.

Therefore, KUZE cannot teach that for which it is offered, e.g., forming a passivation film, on a metallic

material, consisting of oxidized chromium, as recited in independent claim 3.

With respect to claim 5, KUZE fails to disclose or suggest an oxidizing atmosphere comprising oxygen diluted by an inert gas. Instead, KUZE is limited to air and wet hydrogen (See, e.g., column 3, lines 30-36).

The Official Action offers HUTKIN for teaching that a thin coating layer surface roughness mirrors that of the substrate, and that the substrate surface roughness can be controlled to affect the thin coating layer surface roughness. The Official Action concludes that it would have been obvious to control the surface roughness of the substrate in order to affect the surface roughness of the coating layer and arrive at the claimed substrate surface roughness range.

However, HUTKIN cannot remedy the shortcomings of KUZE with respect to claims 3 or 5 for reference purposes. HUTKIN is directed to the production of pore-free copper foil for a circuit printing board. Chromium oxide is used as a peeling layer between copper foil and carrier substrate. While HUTKIN may discuss a chromium oxide layer and surface roughness, HUTKIN does not disclose forming a passivation film consisting of oxidized chromium by heat treatment in an oxidizing atmosphere. Rather, HUTKIN forms a chromium oxide layer by electroplating.

Thus, the proposed combination fails to teach the features of claim 3, e.g., forming a passivation film consisting

of oxidized chromium by heat treatment in an oxidizing atmosphere, and the features of claim 5, e.g., an oxidizing atmosphere comprising oxygen diluted by an inert gas.

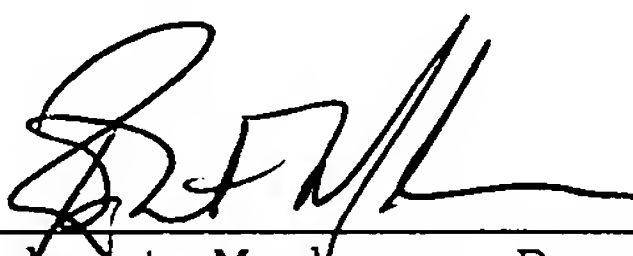
Therefore, for the reasons discussed above the proposed combination cannot render obvious claims 3 and 5, and withdrawal of the rejection is respectfully requested.

In view of the amendment to the claims and the foregoing remarks, applicants believe that the present application is in condition for allowance at the time of the next Official Action. Allowance and passage to issue on that basis is respectfully requested.

The Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 25-0120 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17.

Respectfully submitted,

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